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PROJECTS

This department welcomes brief notes and article-length manuscripts. The former may include announcements of contemplated ongoing projects, information on doctoral theses in progress or completed (writer, title, institution, supervisor, and available information on completion time), proposals and questions, and requests for assistance. Announcements of individual research projects, including theses, are very important to avoid awkward and wasteful duplication of effort. Articles will ordinarily describe projected, in progress, or completed large-scale projects involving one or several scholars and should follow the same standards as other articles.

Mathematical Logic in the Soviet Union, 1917–1980

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The three primary goals of this study are (1) to present the historical factors giving rise to the study of mathematical logic in the USSR and to trace in general outline the main lines of development in logic research in the USSR from 1917 to 1980; (2) to present a complete account, through compilation of an exhaustive bibliography, of Soviet research in all major fields of mathematical logic (including history of logic) and set theory; and (3) to examine in detail the main lines of research of Soviet work in mathematical logic, including model theory, set theory, recursion theory, algebraic logic and Boolean algebra, proof theory, and constructive mathematics, as well as to provide an in-depth consideration of a selected number of the most significant results in these specializations.

The study begins with a survey of the general history of mathematical logic from the 19th century, and examines within its international setting the role of Russian logicians in this development, with particular attention to the work of P. S. Poretskii (1846–1907). Against this historical setting, the introduction of modern mathematical logic in Russia is traced up to World War I, along with its continuation in the Soviet Union after 1917. The influences of Western scientific work are evaluated through a survey of the literature on the history of mathematical logic by Russian and, later, Soviet logicians. For the Soviet period, the histories of logic in Russia and the Soviet Union written by Sofya A. Yanovskaya and N. I. Styazhkin are examined, as is the history of set theory by F. A. Medvedev. The discussion of Western influence is completed by a survey of translations into Russian of Western works in logic, including textbooks and specialized technical papers.

This survey of the history of logic in Russia before 1917 prepares the way for an investigation of the connections between important results obtained in the forma-

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tive period of mathematical logic and significant contemporary results in the specialized branches of mathematical logic. For example, in S. Yu. Maslov's work of the 1960s and 1970s on developing his inverse method for establishing the deducibility of logical calculi, there is no mention of Poretskii's paper of 1884 on the inverse method for algebraic logic and solutions of logical equations. Although there is thus no direct evidence of an explicit connection between Poretskii's inverse method and Maslov's inverse method, the possibility of an indirect connection between the two will be explored.

The next section of the study will outline general developments in classical and mathematical logic in the Soviet Union. It will survey Russian-language logic textbooks, beginning with M. S. Volkov's *Logicheskie Ischislenie* (Logical Calculus) of 1888, and continuing to the present; attention will also be paid to the development of the logic curriculum, as exemplified in A. A. Stolyar's high-school introductory text *Elementarnoe vvedenie v matematicheskuyu logiku* (Elementary Introduction to Mathematical Logic) of 1965.

The study later focuses on the early Soviet period, and in particular on the development of combinatorial logic by M. I. Sheinfinkel' (Schönfinkel), and of constructive logic by A. N. Kolmogorov and A. A. Markov. Kolmogorov's famous paper of 1925, "On the Principle of Excluded Middle," provided the first formalization of constructive logic, and opened the way for the very active work of A. A. Markov, G. S. Tseitin, and many others in constructive mathematics during the early Soviet period and in the present day. The historical survey of the early period ends with a discussion of the formation of schools of set theory around N. N. Luzin and, slightly later, around P. S. Novikov, and a school of algebraic logic around A. I. Maltsev. Also considered is the work of I. I. Zhegalkin in classical quantification theory, of A. D. Aleksandrov in geometry and foundations of mathematics, and of A. I. Maltsev in the metamathematics of algebraic systems.

The final part of the study undertakes two major tasks: to survey the main lines of Soviet research in the specialized branches of mathematical logic—set theory, model theory, algebraic logic (including Boolean algebra), recursion theory, proof theory, and constructive mathematics—and to examine in depth a selected number of the most significant results in these specializations, for example, Yu. V. Matiyasevich's proof (1970) that the problem of the solvability of diophantine equations is undecidable, and the development of Maslov's inverse method (1964) for establishing the deducibility of logical calculi. Both general set theory and point set theory will be surveyed. Among the work to be considered in some depth is that of Ershov on the theory of numerations and on hierarchy of sets, and of Mints on proof theory. Attention will also be paid to the contributions of logic to related areas, with special attention to topology, including the connection between the Tichonov product theorem and the axiom of choice; to group theory, including Novikov's solution to the word problem for groups; and to number theory, including Matiyasevich's negative solution to Hilbert's 10th problem concerning diophantine equations, using recursion-theoretic methods. Contributions

of other areas of mathematical logic, in particular the contributions of category theory to such areas as proof theory in the work of Mints, will also be stressed. Modal and multiple-valued logics, and other nonclassical logics, will be considered only in passing, to fill in the discussion of the general developments in the broad history of logic.

Mathematical Logic in the Soviet Union is part of a larger project on *Soviet–Russian Logic: Origins, Themes, Discussions,* which will include sections on dialectical and philosophical logic by Thomas J. Blakeley of Boston College.

Anyone willing to share old notes, (p)reprints, photographs, syllabi, correspondence, or similar material relevant to the history of mathematical logic in the Soviet Union should contact Irving H. Anellis at the above address. Any forwarded material will be gratefully acknowledged, and promptly returned if the lender so requests. Especially sought is material by or about Soviet logicians from the period circa 1930–1965. Inquiries and comments are also invited.

John von Neumann Memorabilia

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Nicholas Vonneuman (brother of John von Neumann) and Israel Halperin (student and co-worker of von Neumann) announce that they are collecting memorabilia related to the life and work of John von Neumann, i.e., letters (or copies thereof), offprints, articles, books, photographs (identified as to time and place), and any other relevant material. Whatever is collected will be used to track down other material. All material collected will be held in trust and finally deposited with the library of some central institution, available to future historians. Contributions are welcome and should be sent to either Nicholas Vonneuman at 1396 Lindsay Lane, Meadowbrook, PA 19046, U.S.A., or Professor Israel Halperin, Mathematics Department, University of Toronto, Toronto, Ontario M5S 1A1, Canada.